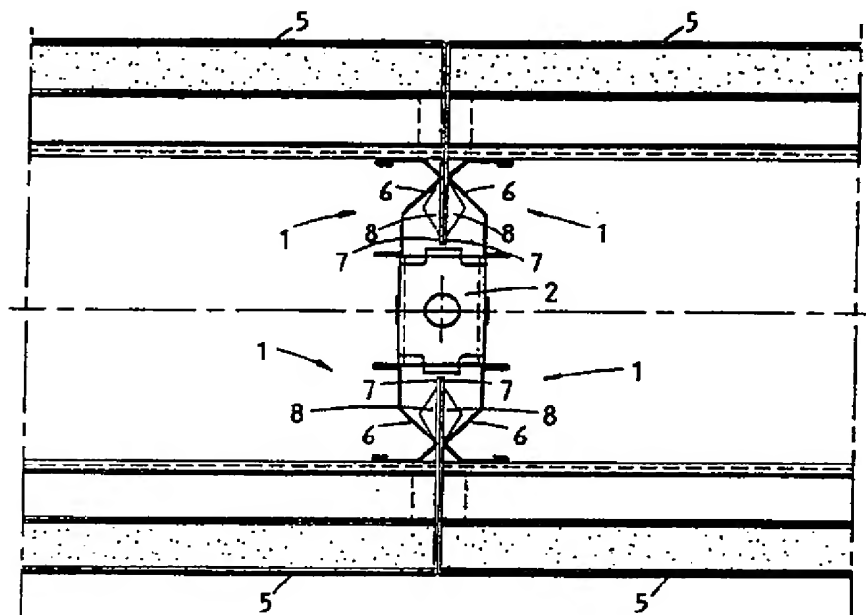




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : E04B 2/78	A1	(11) International Publication Number: WO 96/27057 (43) International Publication Date: 6 September 1996 (06.09.96)
(21) International Application Number: PCT/BE96/00022 (22) International Filing Date: 1 March 1996 (01.03.96) (30) Priority Data: 9500183 2 March 1995 (02.03.95) BE (71) Applicant (for all designated States except US): CHICAGO METALLIC CONTINENTAL N.V. [BE/BE]; Oud Sluisstraat 5, B-2110 Wijnegem (BE). (72) Inventor; and (75) Inventor/Applicant (for US only): BAETEN, Ton [NL/NL]; Dotterbeemd 6, NL-5551 GH Dommelen (NL). (74) Agents: PIERAERTS, J. et al.; Gevers Patents, Holidaystraat 5, B-1831 Diegem (BE).		(81) Designated States: AL, AM, AT, AT (Utility model), AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>

(54) Title: STRUCTURAL ELEMENTS FOR THE CONSTRUCTION OF WALLS AND THE LIKE

**(57) Abstract**

The invention relates to structural elements for constructing walls and the like, characterised in that they essentially consist of clamping profiles (1) that are connected two by two by connecting pieces (2) locally slidable in said clamping profiles (1), which clamping profiles (1) have resilient wings (6) directed towards each other between which the flange (7) of a panel (5) can be pushed and against which an achievement profile (10) can be held clamped which extends perpendicularly with respect to this panel (5).

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgyzstan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	KZ	Kazakhstan	SG	Singapore
CH	Switzerland	LI	Liechtenstein	SI	Slovenia
CI	Côte d'Ivoire	LK	Sri Lanka	SK	Slovakia
CM	Cameroon	LR	Liberia	SN	Senegal
CN	China	LT	Lithuania	SZ	Swaziland
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	LV	Latvia	TG	Togo
DE	Germany	MC	Monaco	TJ	Tajikistan
DK	Denmark	MD	Republic of Moldova	TT	Trinidad and Tobago
EE	Estonia	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	UG	Uganda
FI	Finland	MN	Mongolia	US	United States of America
FR	France	MR	Mauritania	UZ	Uzbekistan
GA	Gabon			VN	Viet Nam

"Structural elements for the construction of walls and the like".

This invention relates to structural elements for the construction of walls and the like.

5 The object of the invention is the elaboration of structural elements that are composed of panels to be clamped together and thereto appertaining profiles whereby the construction of walls with a smooth continuous surface is made possible.

10 To make this possible according to the invention, the structural elements according to the invention are composed of clamping profiles that are connected two by two by connecting pieces locally slidable in said clamping profiles, which clamping profiles have
15 resilient wings directed towards each other between which the flange of a panel can be pushed and against which an achievement profile can be held clamped which extends perpendicularly with respect to this panel.

20 Still according to the invention said clamping profiles have a hollow chamber in cross-section whereof two sides form said wings whereof the edges diverge beyond the place where said wings touch the said flange of a panel, and at such an angle that against said edge the longitudinal edge of an achievement profile can
25 be held pushed, whereas this edge further still is perpendicularly bent with respect to the longitudinal symmetry plane of the clamping profile.

30 A characteristic of this invention is that said panels have a flange extending perpendicularly with respect to this panel, which flange has locally extending protrusions with a height that is calculated in order to

let the concerned resilient wing slide over it on one hand and on the other hand to be held back by this protrusion.

5 According to a possible embodiment said achievement profile has two longitudinal borders that are bent at their ends in order to be pushed in the working state against the under an angle bent resilient wings of said clamping profiles.

10 In a preferred adapted realization said achievement profile has an arched cross profile between the two said longitudinal borders in order to assure a clamping effect of the achievement profile with respect to their clamping profiles connected with each other.

15 Other details and advantages of the invention will appear from the following description of structural elements for the construction of walls and the like, according to the invention. This description is exclusively given by way of example and does not limit the invention. The reference numbers are related to the elements shown in the figures annexed hereto.

20 Figure 1 is a view according to a horizontal cross section of two clamping profiles connected to each other with therewith cooperating extremities of two panels.

25 Figure 2 illustrates a view according to a horizontal cross section of an achievement profile for a wall or a part of a wall.

Figure 3 illustrates still according to a similar cross section the connection between two achievement profiles and a column with circular cross section.

30 Figure 4 illustrates according to a vertical longitudinal section the connection between the upper- and bottom extremity of a panel with a floor, respectively a ceiling.

35 Figure 5 illustrates according to a perspectival view a connection piece such as provided for the clamping of two clamping profiles.

Figure 6 illustrates a top view and on an other scale a connecting component to be mounted between two continuous grooves appertaining to two frames.

Figure 7 illustrates a side view of the connecting component according to figure 6.

Figure 8 illustrates the set up of the clamping profiles mounted in the horizontal plane.

Figure 9 relates to the installation of a particular profile to be used for the mounting of a glazing.

Figure 10 relates to the same matter as figure 9 upon the mounting of glazing on two levels.

The structural elements presented by these different figures are essentially composed of clamping profiles 1 that form vertical components in the presently proposed embodiment. Two such clamping profiles are connected with each other by connecting pieces 2. The shape of a connecting piece 2 appears very clearly in figure 5 where the connecting with a clamping profile is also visible.

By changing the width of the connecting piece 2 the thickness of the structure of panels can also be modified, without having to modify other structural elements.

A connecting piece 2 has in the working state the profile of an inverted U with two tonguelets 3 sideways that can be slid in and fit in elongated notches 4 that are provided on one side of the sides of a clamping profile. The tonguelets are sufficiently resilient to assure the blocking of the connecting piece 2 with respect to a clamping profile 1.

The clamping profiles that are with the panels 5 the fundamental components of the structural elements for the forming of walls, are formed by the bending of a metal sheet so that a hollow chamber is formed with two resilient wings 6 that are directed

towards each other at the height where these resilient wings clamp the flange 7 of a panel 5.

5 The panels are composed of thin-walled sheet material totally or partially filled with plaster and/or an isolating material.

10 The clamping effect is made possible because on the flanges 7 which are perpendicular to the panel 5 protrusions 8 are each time locally formed. The triangular shape of these protrusions 8 is calculated so that, when a panel is pushed with its flange 7 between two resilient wings 6 of the clamping profile 1, the concerned resilient wing slides towards the clamping profile over the therewith cooperating triangular protrusions 8. When the flange 7 of a profile 1 is totally pushed inside, it can not simply slide out. In the mounted state of a panel the triangular protrusion 8 of a flange stays embedded in the clamping profile.

15 In reality two consecutive panels always closely fit so that between two resilient wings 6 of a clamping profile two flanges 7 each appertaining to a panel 1 always stay embedded. This situation is well explained by figure 1.

20 When a wall for some reason does not continue or when two walls because of the intervention of a vertical component, such as a pillar 9 (figure 3), have to be connected, an achievement profile 10 can be used. Such an achievement profile preferably has an arched cross profile. Two longitudinal edges 11 of such an achievement profile are bent in such a way so that they, in the mounted state, stay blocked between the flange 7 of a panel and the under an angle bent resilient wing of a clamping profile.

25 Such an achievement profile 10, in its mounted state with respect to two clamping profiles 1 is very clearly shown in figure 2.

Also in figure 3 two such achievement profiles are represented but in a modified embodiment. Indeed the arched cross profile of the achievement profile is locally interrupted in order to form a continuous elongated groove 12 wherein flexible straps 13 are situated against which the achievement profile can stay pushed against the pillar 9. The achievement profile can be screwed onto the pillar 9 or fixed in another way with respect thereto.

Thanks to this disposition it immediately appears that walls constructed from the above described panels and clamping profiles can be connected under whatever angle with each other. The visible walls, as well from the panel 5 as from the achievement profile 10, shown, in the mounted state, a nice finished view whereof the joints, which are indeed visible, are reduced to a strict minimum.

For the mounting of the panels with respect to a floor or a ceiling use is made of components that are given in detail in figure 4. In this figure the panels 5 are visible and also the manner according to which these panels can be slid at the bottom as well as at the top along the outside of the frames 14. The frames 14 have along the edge that connects either a floor 15, or a ceiling 16, each time a continuous groove 17 wherein, respectively against which, the extremities 18', respectively 18'', of a connecting component 18 can be pushed. The frames 14 are thus always held at the same distance from each other. Upon mounting the panels 5 partly slide out of these frames.

The correct height of the panels 5 is determined with respect to a floor by adjusting a setscrew 19 that cooperates with a clamping bolt 20 that belongs to the lowest U shaped component 21 appertaining to the panels 5.

Besides the above described use of vertically mounted clamping profiles, said clamping profiles can also be adapted in the horizontal space upon modification of the connecting pieces (figure 8). The connecting piece 2', also provided with tonguelets 3', has two wings 21. On said wings horizontally extended clamping profiles can be blocked. These wings 21 extend along both sides of the tonguelets 3.

Figure 9 clearly illustrates the manner in which, using horizontal clamping profiles 1, glazing plates 22 can be mounted. With respect to the upper wings 6 of the clamping profiles 1 a profile 23 is applied whereof the longitudinal edges are bent Z shaped in order to finally form a flange 24. Thereupon a L shaped profile 25, whereof one flange is provided with protrusions 8, is clamped between both the wings 6. Continuous closing strips 26 of rubber or a flexible plastic material are placed between the extremities of the profile 23 and the edge bent perpendicularly of the L shaped profile 25.

In figure 10 the same components are used in their adaptation for a glazing on two levels.

The invention is not only limited to the hereabove described embodiment and modifications can be brought to it for as much as they are comprised in the scope of the claims hereto annexed.

CLAIMS

1. Structural elements for constructing walls and the like, characterised in that they essentially consist of clamping profiles (1) that are connected two by two by connecting pieces (2) locally slidable in said
5 clamping profiles, which clamping profiles (1) have resilient wings (6) directed towards each other between which the flange (7) of a panel can be pushed and against which an achievement profile (10) can be held clamped
10 which extends perpendicularly with respect to this panel.

2. Structural elements according to claim 1, characterized in that said clamping profiles (1) have a hollow chamber in cross-section whereof two sides form said wings (6) whereof the edges diverge beyond the place
15 where said wings touch the said flange (7) of a panel, and at such an angle that against said edge the longitudinal edge of an achievement profile (10) can be held pushed, whereas this edge further still is perpendicularly bent with respect to the longitudinal symmetry plane of the
20 clamping profile.

3. Structural elements according to claim 2, characterized in that said edge of a resilient wing (6) is bent over an angle in order to embed an achievement profile (10).

4. Structural elements according to one of the claims 1 and 2, characterized in that said panels (5) have a flange (7) extending perpendicularly with respect to this panel, which flange has locally extending protrusions (8) with a height that is calculated in order to let
25 the concerned resilient wing (6) slide over it on one hand and on the other hand to be held back by this protrusion (8).

5. Structural elements according to one of the claims 1 to 4, characterized in that said connecting piece (2), destined to connect two clamping profiles (1),
35 is profiled in U shape and has, in the working state, two

sideways downwardly extended tonguelets (3) that can be slid resilient in the thereto provided elongated notches (4) provided in said clamping profiles (1).

5 6. Structural elements according to claims 2 to 5, characterized in that said achievement profile (10) has two longitudinal borders (11) that are bent at their ends in order to be pushed in the working state against the under an angle bent resilient wings (6) of said clamping profiles (1).

10 7. Structural elements according to claim 6, characterized in that said achievement profile has an arched cross profile between the two said longitudinal borders in order to assure a clamping effect of the achievement profile with respect to their clamping profiles connected with each other.

15 8. Structural elements according to claim 7, characterized in that said arched cross profile is interrupted in its middle in order to be able to cooperate with a pillar with circular cross section and therefor has an elongated groove (12).

20 9. Structural elements according to one of the claims 1 to 8, characterized in that said panels (5) are composed of two components and can be slid on the top and on the bottom over continuous frames (14).

25 10. Structural elements according to claim 9, characterized in that said frames (14) have a continuous groove (17) along the side that is turned inwardly in the working state in which groove the extremities (18') of a connecting component (18) fit in order to assure a correctly maintained spacing between said frames (14).

30 11. Structural elements according to one of the claims 1 to 10, characterized in that said panels (5) in the working state are embedded at the bottom in a U shaped component (21) that is provided with a clamping bolt (20) with a setscrew (19) in order to determine the height of the panel (5), with respect to the floor (15).

12. Structural elements according to one of the claims 5 to 11, characterized in that said connecting pieces (2) have wings (21) on both sides of aforesaid tonguelets (3) whereon clamping profiles (1) can be mounted.

13. Structural elements according to one of the claims 1 to 12, characterized in that, for the installation of a panel made of glass or the like a profile (23) is provided with Z shaped bent longitudinal borders in order to form a flange (24) that cooperates with a flange (25') that is provided with protrusions (8), whereby the clamping of flange (25') with respect to the resilient wings (6) is made possible, whereas the profile (23) itself with respect to two clamping profiles (1) can be blocked.

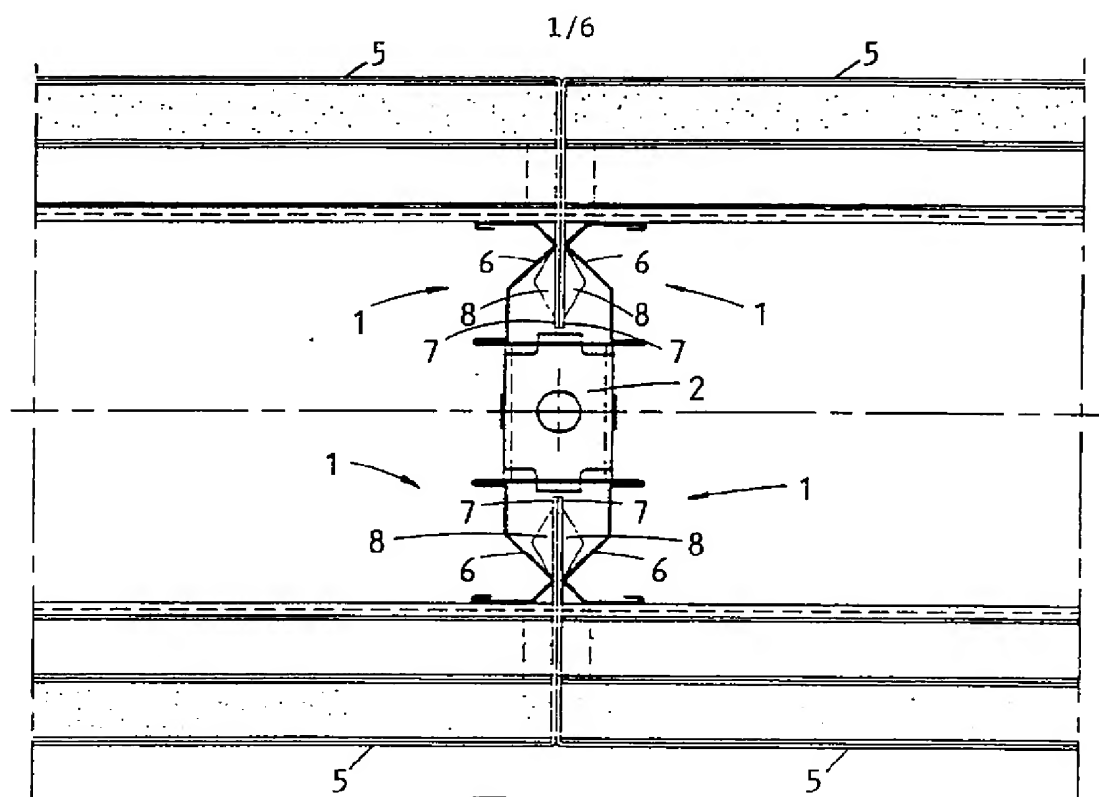


Fig. 1

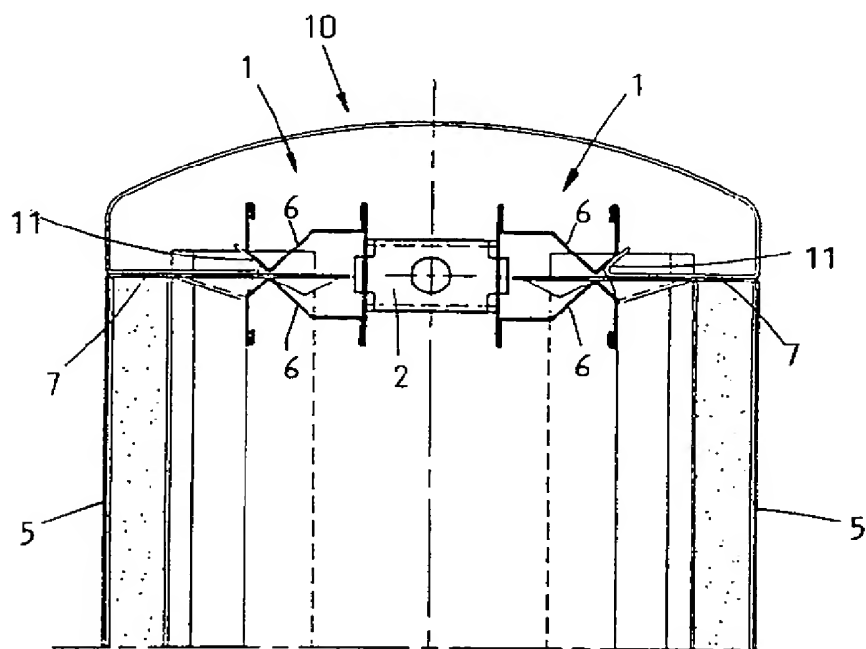
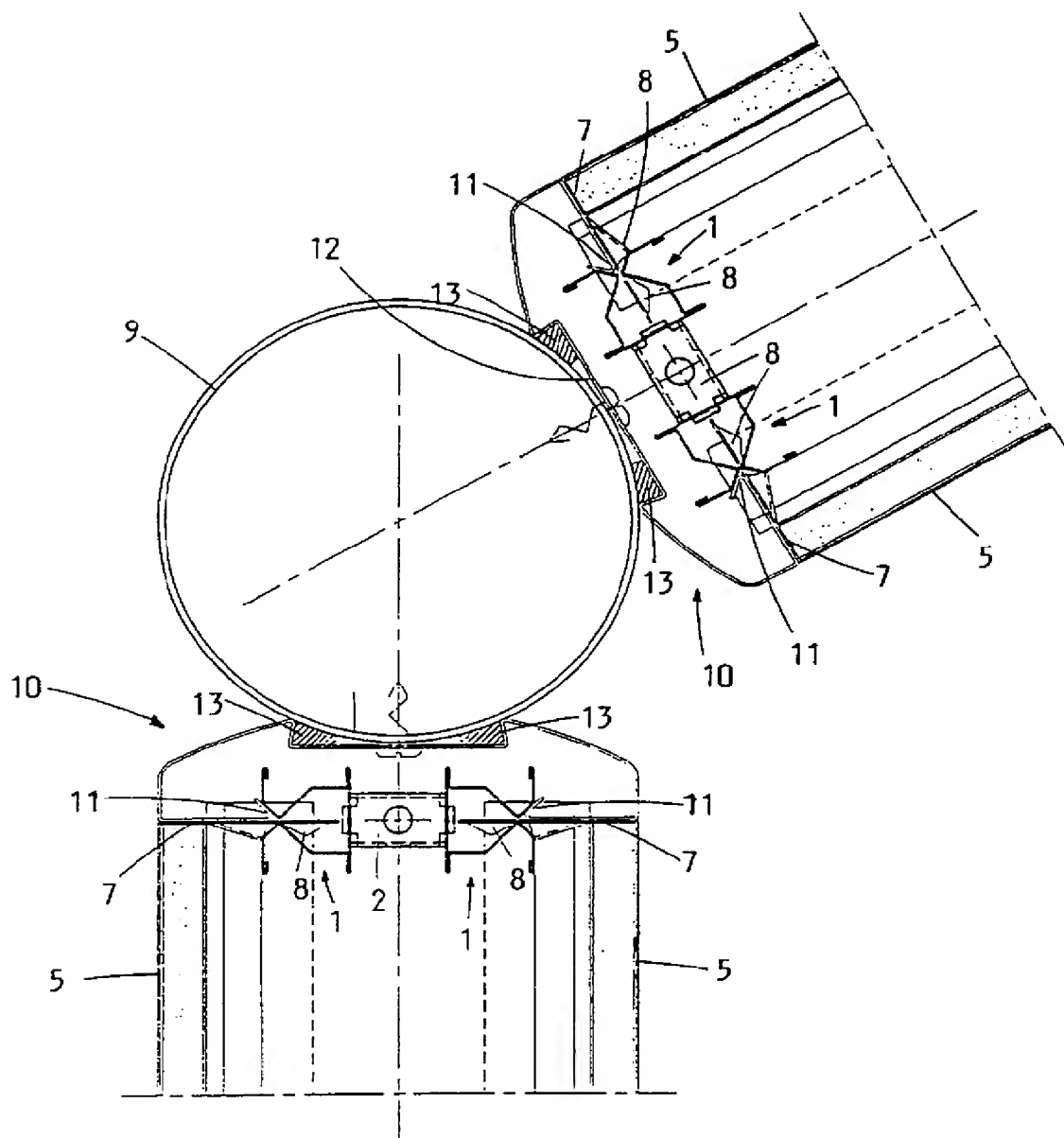
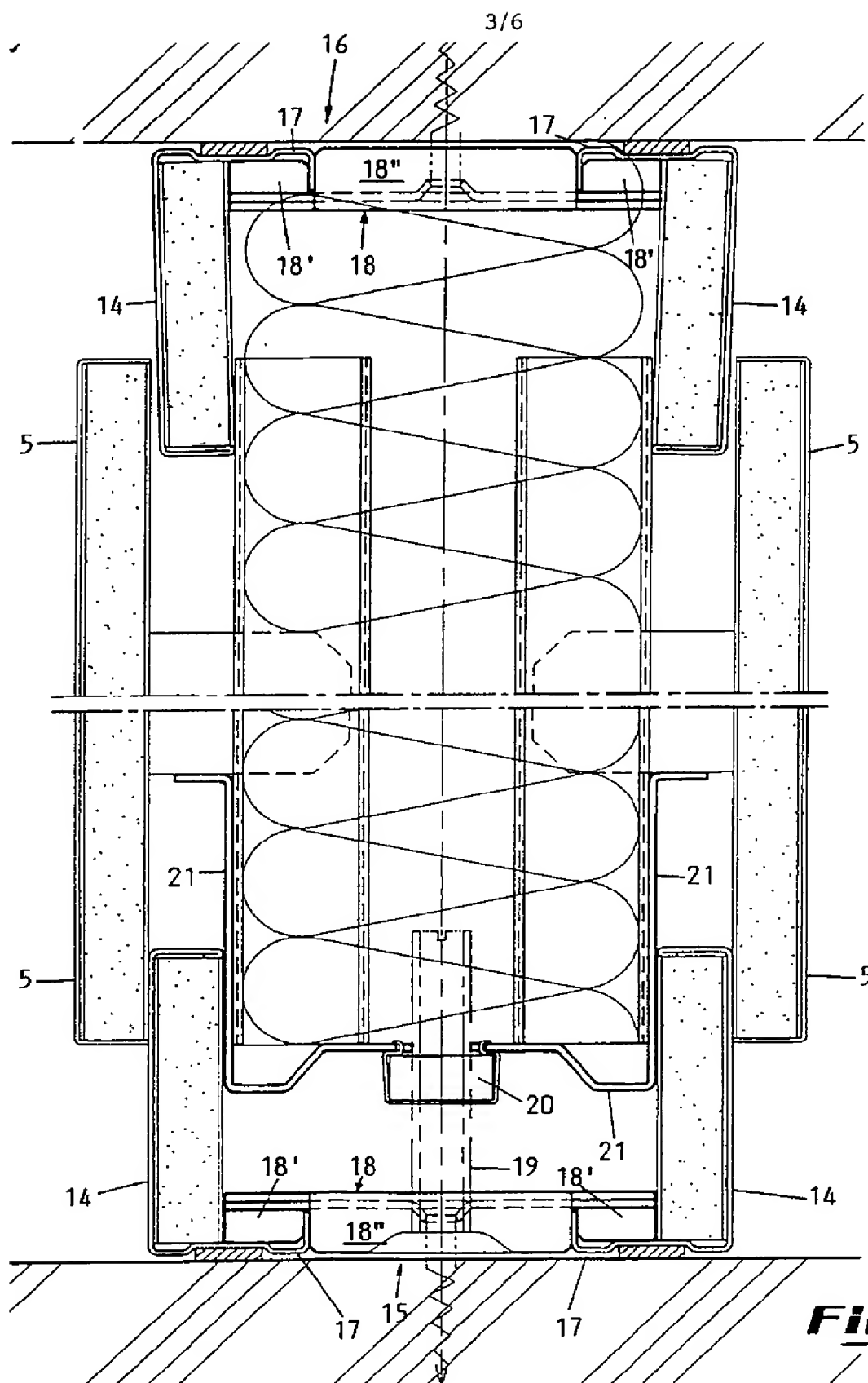


Fig. 2

2/6

**Fig. 3**

**Fig. 4**

4/6

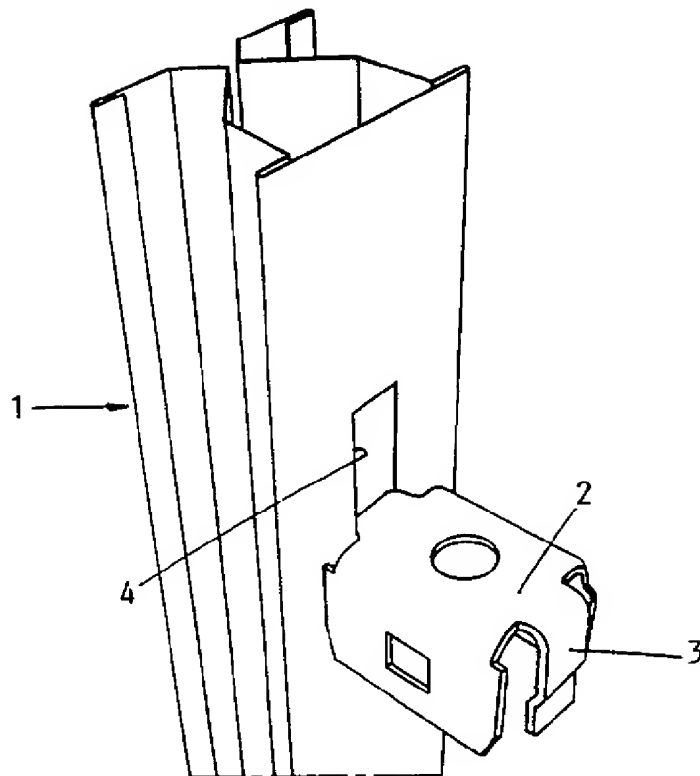


Fig. 5

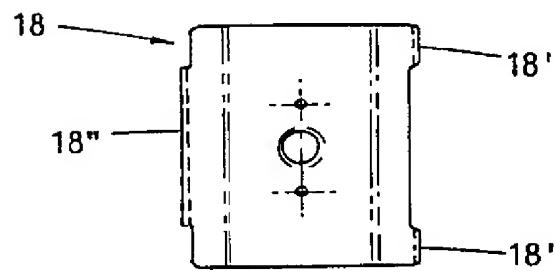


Fig. 6



Fig. 7

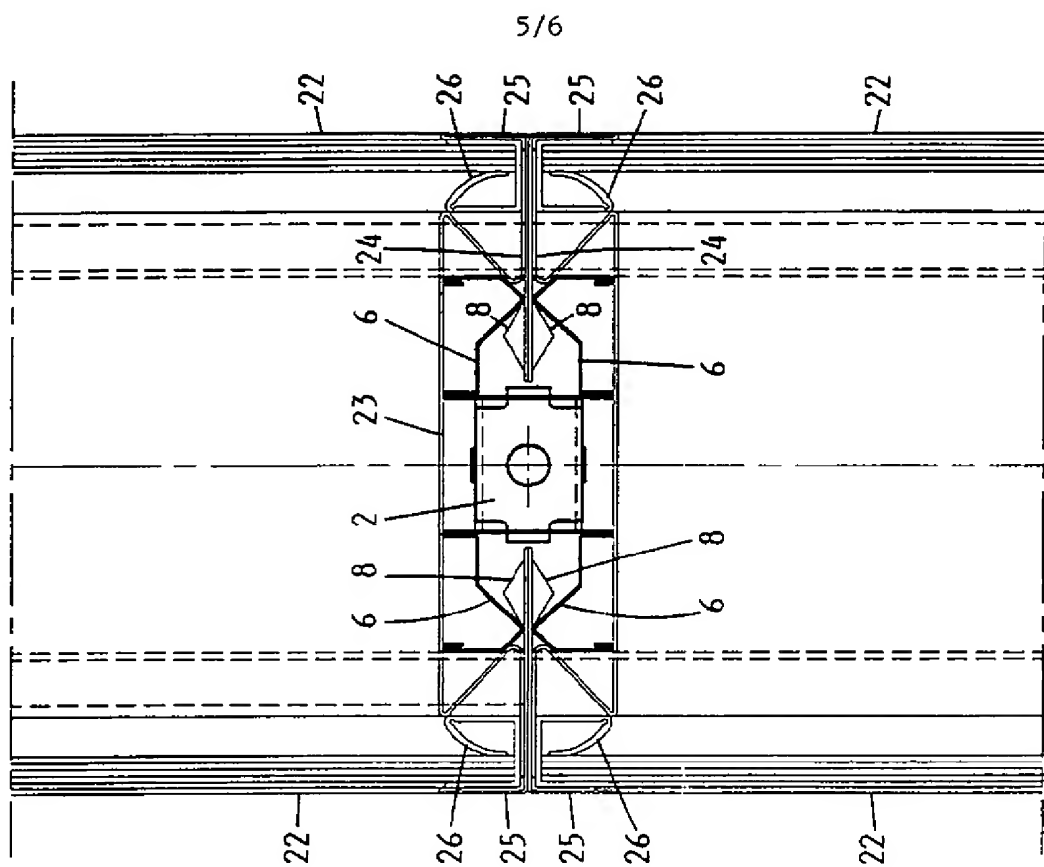


Fig. 10

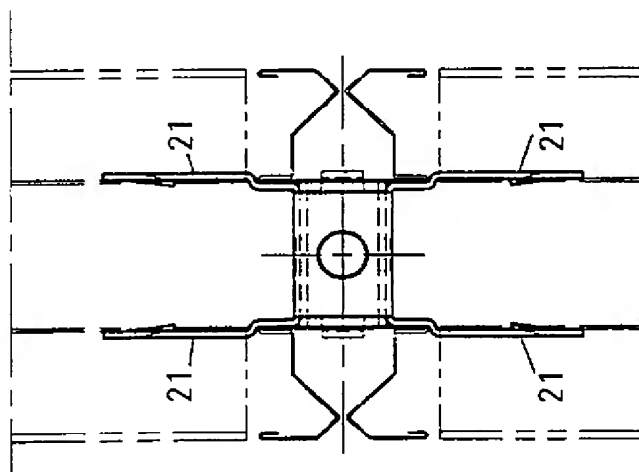
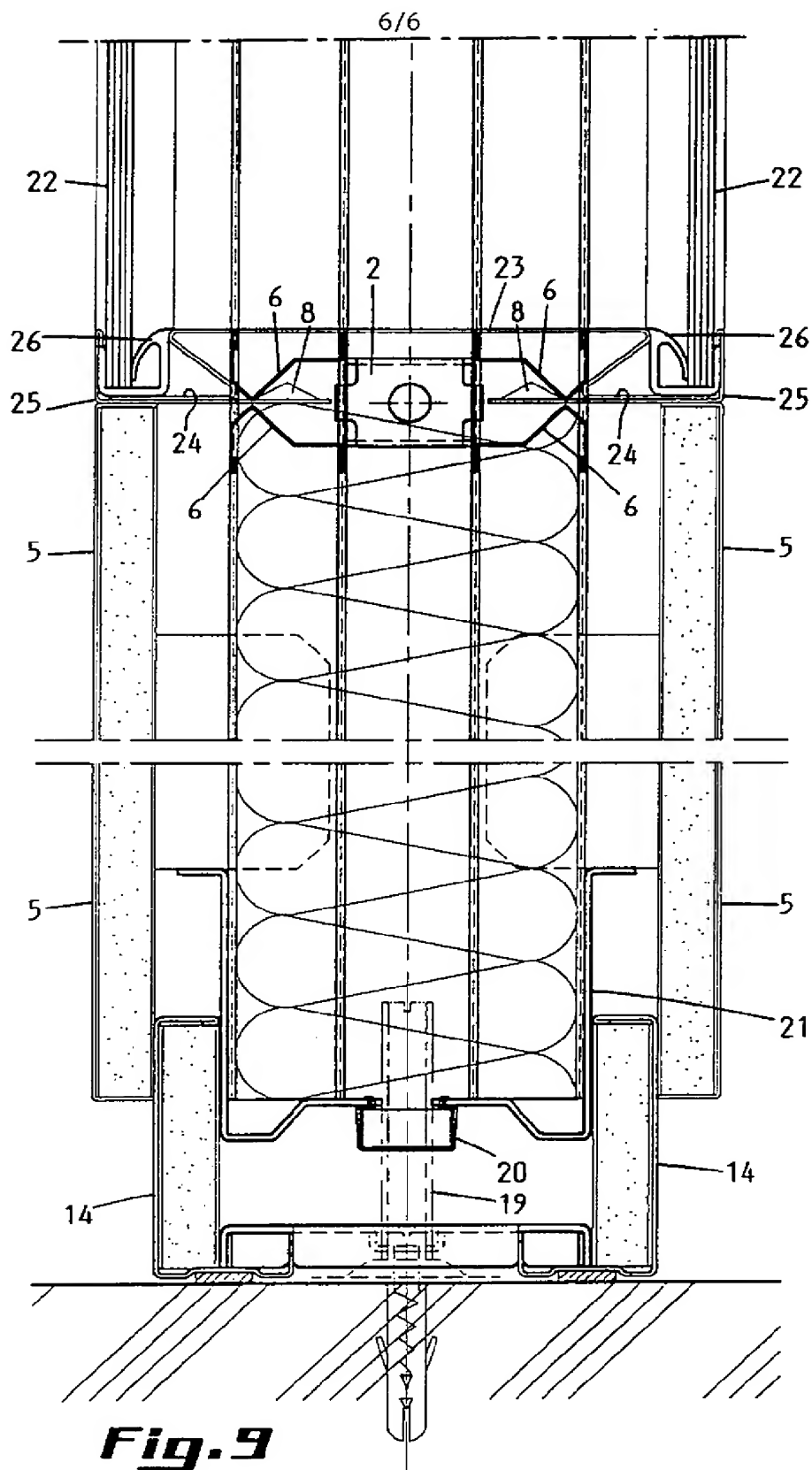


Fig. 8



INTERNATIONAL SEARCH REPORT

International Application No
PCT/BE 96/00022

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 E04B2/78

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 E04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE,A,19 47 838 (FLANGEKLAMP CORP) 1 April 1971	1,2
Y	see page 5, line 3 - page 7, line 19	3,4,6,7
A	see page 9, line 22 - page 10, line 26; figures 4,6,13,14	5

X	FR,A,2 163 757 (WESTAG & GETALIT AG) 27 July 1973	1,2
	see page 4, line 6 - page 5, line 33; figures	

Y	US,A,5 184 441 (BALFANZ) 9 February 1993	3,6,7
	see column 3, line 4 - column 4, line 17; figures 1,2	

Y	US,A,2 412 404 (JACKSON) 10 December 1946	4
	see column 2, line 11 - line 43; figures 1,2,7,8	

	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

Date of the actual completion of the international search

25 June 1996

Date of mailing of the international search report

- 4. 07. 96

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax (+31-70) 340-3016

Authorized officer

Porwoll, H

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR,A,1 250 320 (JASINSKI) 29 March 1961 see page 1, right-hand column, line 36 - page 2, left-hand column, line 31; figures ---	1,2
A	FR,A,1 229 772 (PIGET) 9 September 1960 see page 1, right-hand column, line 28 - line 41 see page 2, left-hand column, line 46 - line 52; figures 2,5,15,16 ---	1,2
A	CA,A,1 115 923 (MENNIE) 12 January 1982 see page 5, line 15 - line 20; figures ---	5
A	GB,A,511 074 (HARRIS & SHELDON LTD) 14 August 1939 see page 4, line 19 - line 102; figures 1,2 ---	5
A	AU,A,8 676 675 (BALL) 26 May 1977 see page 2, line 1 - line 8; figures 1,2 ---	6,7
A	US,A,4 119 287 (MOLLENKOPF) 10 October 1978 see column 2, line 17 - line 35; figure 2 -----	8

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No.

PCT/BE 96/00022

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE-A-1947838	01-04-71	BE-A- 739604	02-03-70
		FR-A- 2001590	26-09-69
		GB-A- 1259347	05-01-72
		NL-A- 6914013	17-03-71
		US-A- 3537217	03-11-70
		US-A- 3553916	12-01-71
FR-A-2163757	27-07-73	DE-A- 2162383	20-06-73
		AT-B- 318870	25-11-74
		CH-A- 554983	15-10-74
		NL-A- 7217044	19-06-73
US-A-5184441	09-02-93	CA-A- 2068114	15-11-92
US-A-2412404	10-12-46	NONE	
FR-A-1250320	29-03-61	NONE	
FR-A-1229772	09-09-60	NONE	
CA-A-1115923	12-01-82	NONE	
GB-A-511074		NONE	
AU-A-8676675	26-05-77	NONE	
US-A-4119287	10-10-78	NONE	